



CAD  
CAM

CAD  
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WARRIOR

*Operations Manual*

# Cadcam Warrior

## *Contents*

Setting up DISK.....	2
Setting up CASSETTE .....	3
Introduction .....	4
The Story .....	6
The Map .....	13
The Game .....	16
The Game (French) .....	19
The Game (German) .....	22
The Design Team .....	25
Further information .....	27

# Cadcam Warrior

## Commodore 64 DISK Version

### LOADING INSTRUCTIONS

1. Begin with computer switched off. Remove all peripherals except disc unit and TV or monitor.
2. If you have a Currah Micro Speech unit fit it now in accordance with its instructions.
3. Switch on and insert the disk into the 1541 drive.
4. Type LOAD"CCW",8,1, and press return.  
The game will load and autorun.

### SETTING UP

1. If you have a joystick use port 2.
2. If using keyboard control, L = Left := Right  
RUN/STOP = Up, C = Down, space-bar = fire.
3. Use the volume control on TV or monitor.
4. Press FIRE to play.

# Cadcam Warrior

## Commodore 64 CASSETTE Version

### LOADING INSTRUCTIONS

1. Begin with computer switched off. Remove all peripherals except cassette unit and TV or monitor.
2. If you have a Currah Micro Speech unit fit it now in accordance with its instructions.
3. Switch on and check the tape is fully rewound.
4. Hold down SHIFT and press RUN/STOP then press PLAY on the tape unit.

The programme will load and auto-run.

NOTE: The ultra fast loader PAVLODA has been used to reduce loading time to about 3 minutes. It is normal for PAVLODA to produce a very colourful screen whilst loading.

### SETTING UP

1. If you have a joystick use port 2.
2. If using keyboard control, L = Left := Right  
RUN/STOP = Up, C = Down, space-bar = fire.
3. Use the volume control on TV or monitor.
4. Press FIRE to play.

# Cadcam Warrior

## Introduction

Computer Aided Design and Computer Aided Manufacture is a revolution which has already begun. In the world of engineering, CAD (design/draughting) has turned many design offices into hi-tech environments. Machines display the designers scheme on a high resolution screen, with input from a bit-pad (electronic drawing tablet) rather than a keyboard. The power of the computer behind the display really comes into its own in the manipulation of this design information, i.e., the ease with which the design can be changed, the rotation of the displayed object to give a 3D view together with textured finishing to give the look of a finished solid object and the storage and retrieval of similar designs or families of component designs.

Typically CAD shows a cost effectiveness in high volume engineering applications or large scale plant/structure design. Accordingly the machines involved are often multi-user mini's like DEC's VAXII/780 although CAD packages do exist for Acorn and Epson QX10's.

# Cadcam Warrior

Since the engineers and toolmakers first introduced digitally controlled lathes and milling machines, the gap between the design office and the machine shop has been closing. The tool and mould makers for the plastics industry have been quick to implement complete CAD/CAM facilities. During a recent demonstration a manufacturing company approached a CAD/CAM installation, brought with them an idea of a telephone handset, they modelled it, analysed it and graphically machined it – all in one day, with no viewing of the part prior to their arrival. Clearly the implementation of CAD/CAM in industry can be cost effective already. It is just as certain that the machine's involvement is still in its infancy.

For the future, as more and more of our environment is planned and constructed by/with machines, it will fall to the software and operating systems of those machines to interpret the rules by which we want to live.

# Cadcam Warrior

## The Story

(Fiction)

As they prepared for the 25th Cadcam International Show it became obvious that the boys from Enviro UK would have to really move. They'd booked most of the first floor as space only and that's the way it looked with just 24 hours before the doors opened. There was no sign of hi-tech stands, demo equipment, handouts or razamataz while all around the air was filled with the clamour of build-up day.

Only 45 miles away in Victoria Court Clean-air Complex the calm atmosphere of Research HQ – Enviro UK heaved and shattered as Bob Marsh hit the roof. None of the ultra-cool wafers had arrived, the holograph interpreter wouldn't gel and now MAD-2 (Micro Assembly Droid – 2) was just plain missing.

Bob is Project Director for the Total Environment wrap round program. All (!) he has to achieve is the translation of living requirements into

# Cadcam Warrior

structures. The breakthrough came two years ago when the imaging lasers were successfully integrated with a thread shot spinner. The principle has been developed so that now the designers schematic – displayed by the imaging lasers can be directly translated into a solid structure. This production facility is linked to a modified AI-12b from GDC (the artificial intelligence people) so that the programme can comprehend what is meant by, for instance, "A cleaner concept for living" then design and build "the better living environment". The major modification to the control hardware was the use of background wafers to provide the huge active database of living standards – everything from building regulations to the dreams of humble dwellings.

The idea of booking "space only" at the show was brilliant. In the centre will sit the Enviro demonstration unit – the surrounding area will hold all those structures created by it. The (selected) show visitor simply states his requirements then has his mind blown as the suggested structure is constructed there and then right in front of his eyes. How can we fail – we're all going to be RICH.

## Cadcam Warrior

Marsh wasn't feeling rich — he was feeling sick. There was no time to wallow he had to make the decision to go. Go for it — pack the gear, ship it down to Olympia 3, send a runner for the wafers — they're pre loaded and we'll fit them on site, grab some fixers and tweak the h-interps on the way down. Anything — just get there and set up.

You should have seen their faces — acres of low-stat flooring to fill and we turned up with just two small trucks and the E frame. There was no point in keeping anything under wraps — none of the incredulous contractors would guess the nature of the breakthrough and anyway we still had work to do. Set up only took 3 hours and the laser alignment was going well. We still lacked the wafers but they were on their way and they'd only take a moment to fit. Bob began the security procedure.

The security programmes covered two main tasks, first to stop the valuable interface programmes from being examined and secondly to defend the actual manufacturing site from any unforeseen bugs — the result of a bug in the dimensioning could be a structure measuring miles instead of metres! The process of setting traps and retreating out of the

## Cadcam Warrior

programmes (and hardware modules) continued until all that remained was the wafer section and final cover locks.

A courier, still dripping, wanders onto the first floor and is pointed in the direction of the huddle of cabinets and engineers that comprise the entire Enviro stand. Marsh rushes towards him, grabs the precious wafers and commands a minion to sign for them. He whips the shielding off the cryo unit and stuffs the wafers in — check the order — strap on the light-pipes — slam the cover down — set the traps — close and lock the outer casing. It's done. It is ready.

It was with some smugness that a trial was ordered. It was quickly decided that the single most useful item for the area would be a comfortable chair. This almost flippant request for design suggestions was given to the AI-12 and sure enough within one second the first model was produced. Silence — unbelieving silence. Eyes were fixed in absolute horror. A flat, shiny plate of metallic, ungiving harshness with plain-drilled mounting holes lay beneath the E frame. Gradually and in unison all eyes moved from the plate to Bob Marsh. Was this really the entire output of Enviro laboratories for the last four years — a chair that no-one could sit on.

## Cadcam Warrior

His brain was racing — how could it ignore the basic need for softness, for a structure larger than six inches square and how were you supposed to get your feet under a flat plate! Marsh tottered backward, contacted the main casing and sank slowly to the floor. Head in hands he knew the whole reason and there was no one else to blame. The cause could be quickly grasped, the remedy was the problem. AI-12 had completely ignored any requirement that humans need to interface with this chair structure. Not one single need of “people” had been considered and why not? Marsh knew why not — because the wafer containing human needs, in his haste, wasn’t aligned and was not being accessed. The thought of opening the show with a design for a dwelling — forgetting people — wasn’t just embarrassing, it was positively dangerous.

All the security procedures came flooding back. For the duration of the exhibition, there was no way the cabinet could be unlocked or tampered with. Control must be established right now or the project will be lost in ridicule. All thoughts were interrupted by a bright alarm on the main display. AI-12 had an intruder, a complete entity within

## Cadcam Warrior

the console. The guidance and maintenance panel burst into activity as the hacker found a port. The sign-on was beautifully familiar — MAD 2 . . . Ready. Here was the one chance Marsh hadn’t considered, the droid was encased deep within the ’12 and was charged, able and ready.

Now is not the time for debate — Marsh leapt to the panel — every security system will be trying to shut him down. He knows the ’12 will try every combination — creating a hostile environment at every turn but if he can crack the rules for each system he just might be able to find the cryo-wafer module . . . . .

# Cadcam Warrior

## The Map

It is possible to complete the Cadcam Warrior by beating every one of the 8192 screens, though it may take a few days of continuous battle. Faster progress can be made by taking short cuts whenever they occur. Because the layout was generated by machine, there is a pattern to each of the levels. To make it easier to predict where the easier screens, branches and dangers occur, it is necessary to draw a map.

The centre page map shows only one section of one quarter of the entry level. All the detail i.e., ridges and holes, has been omitted from the plates since it is their relative positions only which is important. The red line is the standard (boring) route visiting every location. Notice how large areas can be by passed from a few key plates.

# Cadcam Warrior

All plates on the entry level have a top colour of light blue. There are eight levels, each with its own colour. There are four areas in each level, identified by the type of hole(s) piercing each plate. Throughout these areas different rules prevail. The object is to clear every plate but the way of achieving it is colour coded into the edge of that plate e.g., in any phase with dark blue edges, shoot to kill.



# Cadcam Warrior

## *The Game*

The game pits you directly against the design machine. You control the diminutive droid MAD-2 and the task is to find and repair the memory bank containing human needs.

The final screen can only be reached by finding your way through all the hostile environments which the machine can design. Cadcam Warrior contains 8192 hostile screens. Because they are created by the machine there is a pattern in the creation of, and therefore in the rules of, these areas.

One rule is consistent throughout the game; clear each screen. Just how a screen is cleared must be learnt or deduced – perhaps killing everything in sight will do this time – perhaps mine-laying or even collecting is required.

Your rate of progress will be partly determined by how well you did in the previous phase, by your decision path between screens and by the attributes you may have collected. It is not necessary to play every screen to find the final conflict, and to make any real progress you should understand the layout of the levels (see the section on map making).

# Cadcam Warrior

Each playing screen shows a metallic design with two main surfaces. The upper half of the screen shows the top surface of the plate, which may contain ridges and steps. The lower half shows the darker, underside of the plate. You will have to battle on both surfaces to defeat and clear the opponents. You cannot fall off the edges of any plate and the only path from one surface to the other is to jump through the holes. Don't forget that the guards can follow you. As soon as a screen has been cleared you will be offered a choice of routes. The machine will not actually lie to you but it may not be showing you all the options. Some routes are short-cuts others are disastrous. You will be prohibited from entering some areas without suitable tokens or passwords. Information about where to find the numerous types of token may be given after each completed screen. It is important that you find access to this information regularly if you are to progress quickly.

Different rules apply in different screens. You will always begin at phase one – the rule here is “kill everything quickly and accurately”. Take note of the colours used, they contain the code for the

# Cadcam Warrior

rules for each current phase. Remember that the solution lies in screen 8192 and a large phase counter is provided at the top right of your screen to mark your progress. Your droid has sufficient power to complete every location but is far from invincible.

# Cadcam Warrior

## *Le Jeu*

Le jeu vous oppose directement à la machine de conception. Vous commandez le minuscule automate MAD-2 et votre but est de trouver et de réparer le bloc de mémoire qui contient les besoins humains.

Vous ne pourrez atteindre la dernière scène qu'après vous être frayé un chemin à travers tous les milieux hostiles que la machine peut concevoir. CADCAM WARRIOR contient 8 192 scènes hostiles. Comme ces zones sont concues par la machine, il existe un certain schéma dans leur création et par conséquent dans leurs règles.

Une règle reste la même tout au long du jeu; vous devez surmonter toutes les scènes. C'est à vous d'apprendre ou de déduire la manière dont chaque scène peut être surmontée -cette fois-ci il suffit peut-être de tuer tout ce qui est en vue -ou peut-être faut-il poser des mines ou même en ramasser.

Le rythme auquel vous progresserez dépendra en partie des résultats que vous aurez obtenus dans la phase précédente, du chemin de décision que vous aurez suivi entre les différentes scènes et de ce que vous aurez pu amasser. Il n'est pas nécessaire de jouer chaque scène pour trouver le conflit final; pour faire des progrès effectifs vous devrez comprendre la disposition des différents niveaux (voir la section sur l'établissement de cartes).

# Cadcam Warrior

Chaque scène de jeu montre une forme métallique avec deux surfaces principales. La partie supérieure de l'écran montre le dessus de la plaque qui peut contenir des crêtes et des escaliers. La partie inférieure montre le dessous de la plaque qui est plus sombre. Vous devrez vous battre sur les deux surfaces pour vaincre et éliminer vos opposants. Vous ne pouvez pas tomber des rebords des plaques et la seule manière de passer d'une surface à l'autre est de sauter dans les trous.

N'oubliez pas que les gardes peuvent vous suivre. Dès que la scène aura été surmontée, plusieurs trajets seront soumis à votre choix. La machine ne vous mentira pas vraiment mais elle ne vous montrera peut-être pas toutes les options.

Certaines routes sont des raccourcis d'autres sont catastrophiques. Certaines zones vous seront interdites si vous n'avez pas les objets magiques ou les mots de passe adéquats. Des renseignements sur les endroits où vous pourrez trouver les multiples types d'objets magiques pourront vous être donnés à chaque fois que vous aurez terminé une scène. Il est important que vous puissiez accéder à ces renseignements régulièrement si vous voulez progresser rapidement.

Des règles différentes s'appliquent à des scènes différentes. Vous commencerez toujours à la phase un

# Cadcam Warrior

-dans ce cas, la règle est de "tuer tout avec rapidité et précision". Prenez note des couleurs utilisées, elles renferment le code des règles de la phase en cours. Rappelez vous que la solution est située à la scène 8192; un grand compteur de phases est placé dans l'angle droit de votre écran pour indiquer votre progression. Votre automate a suffisamment d'énergie en lui pour venir à bout de toutes les situations mais il est bien loin d'être invincible.

# Cadcam Warrior

## Das Spiel

Bei diesem Spiel ist die Entwurfsmaschine Ihr unmittelbarer Gegner. Sie steuern den winzigen Adroiden MAD-2, und die Aufgabe besteht darin, die Gedächtnisbank, die menschliche Bedürfnisse speichert, zu finden und zu reparieren.

Die letzte Spielszene erreichen Sie nur, wenn es Ihnen gelingt, sich durch all die feindlichen Umgebungen, die die Maschine entwirft, hindurchzuschlagen. Cadcam Warrior enthält 8192 feindliche Spielszenen. Da sie von der Maschine geschaffen werden, gibt es beim Entwurf dieser Gebiete und damit auch bei den Regeln, die für sie gelten, gewisse Gesetzmäßigkeiten.

Eine Regel gilt für das gesamte Spiel: Jede Spielszene ist von Feinden zu säubern. Wie dies zu geschehen hat, müssen Sie lernen oder ableiten. Manchmal mag es genügen, alles, was in Sichtweite kommt, zu töten; ein anderes Mal ist es vielleicht erforderlich, Minen zu legen oder gar aufzusammeln.

Wie schnell Sie vorankommen, hängt teilweise davon ab, wie gut Sie sich in der vorhergehenden Phase geschlagen haben, welche Entscheidungen Sie zwischen zwei Spielszenen treffen und welche machtvollen Gegenstände Sie gesammelt haben. Es ist nicht nötig, alle Spielszenen durchzumachen, um zur entscheidenden Auseinandersetzung zu gelangen. Um überhaupt voranzukommen, müssen Sie die Konzeption der Ebenen verstehen (siehe Abschnitt über das Erstellen von Karten).

# Cadcam Warrior

Jede Spielszene zeigt eine metallene Scheibe mit zwei Haupt-Spielebenen. Die obere Hälfte des Bildschirms zeigt die Oberseite der Scheibe, die Erhebungen und Stufen aufweisen kann. Die untere Hälfte zeigt die dunklere Unterseite der Scheibe. Sie müssen auf beiden Ebenen kämpfen, um alle Widersacher zu besiegen und aus dem Weg zu räumen. Sie können nicht von der Scheibe herunterfallen, und die einzige Möglichkeit, von einer Ebene zur anderen zu gelangen, besteht darin, durch die Löcher zu springen. Denken Sie daran, daß die Wachen Ihnen folgen können. Sobald die Szene von Feinden gesäubert ist, können Sie zwischen mehreren Routen wählen. Dabei wird die Maschine Sie nicht wirklich belügen, aber sie wird Ihnen auch nicht unbedingt alle möglichen Wege zeigen. Manche Wege stellen Abkürzungen dar, andere führen ins Verderben. Manche Gebiete dürfen nur mit dem richtigen Erkennungszeichen oder der richtigen Losung betreten werden. Wo die vielen verschiedenen Erkennungszeichen zu finden sind, können Sie eventuell nach jeder beendeten Spielszene erfahren. Es ist wichtig, sich regelmäßig diese Informationen zu verschaffen, wenn Sie schnell vorankommen wollen.

Für verschiedene Spielszenen gelten unterschiedliche Regeln. Sie beginnen immer mit Phase Eins. Hier lautet die Regel: "Töte alles so schnell und präzise wie möglich". Achten Sie auf die verwendeten Farben; sie enthalten den Kode für die Regeln für jede gerade

# Cadcam Warrior

ablaufende Phase. Denken Sie daran, daß die Lösung in Spielszene 8192 liegt; in der rechten oberen Ecke Ihres Bildschirms befindet sich ein Phasenzähler, mit dessen Hilfe Sie den Spielstand verfolgen können. Ihr Androide ist stark genug, um in allen Situationen zu bestehen, aber er ist bei weitem nicht unbesiegbar.

# Cadcam Warrior

## The Design Team

Taskset has always believed that a game is bigger than any one programmer. All our products, and Cadcam Warrior especially, are the result of solid teamwork.

At all stages from design concepts through to mastering for duplication, the designers have been working together, originating and solving problems. Consider some of the stages which became the subject of discussion by some or all the team during the development of Cadcam Warrior.

The design concept — this grew from ideas about displaying two alternative game play areas on the same screen. They were originally linked by holes through which the player could conduct two battles simultaneously. This idea, fused with the concept of a machine-created labyrinth, formed the basis for Cadcam Warrior.

Detail definition — to establish the shape of characters and the environment. This is heavily linked to graphic design but must take account of the capabilities of the Commodore 64's screen and the requirement that the major characters be highlighted and have special definition to save them from merging with a many coloured background.

# Cadcam Warrior

Story boards — these are produced to establish the main objectives of the game and to show the view of important scenes on the way to the goal.

Sound — including sound effects and music, the allocation of channels and the mood which the music should induce. The composition and arrangement of an original score was a major consideration.

Game facilities — includes joystick/keyboard player options and number of players. Security, loading screens, memory management. Add to these game requirements, the commercial requirements of scheduling, production, packaging, promotion and funding and the need for a team becomes clear.

These people have contributed to Cadcam Warrior, the order does not necessarily infer greater or lesser involvement. Mark Buttery, Andy Walker, Andy Rixon, Paul Hodgson, Andy Nutter, Ann Fletcher, Adrian Faulkner.

# Cadcam Warrior

## Further Information

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# Cadcam Warrior

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